CHEM 1301 General Chemistry Laboratory I Lec.0 Lab. 3 Cr. 1

Effective Date: Fall 2007

Course Description

Prerequisite or corequesite: CHEM 1201. A laboratory course in fundamental chemical operations and elementary quantitative techniques. (A grade of "C" or better is required to advance to any higher numbered chemistry course.)

Course Objectives

Students will:

1. Learn proper basic laboratory techniques
2. Understand basic chemistry concepts demonstrated by the laboratory procedures
3. Report measurements properly and use them to determine calculated values
4. Learn the proper use of a laboratory notebook

Procedures to Evaluate these Objectives

1. Prelab assignments which acquaint the student with the concepts being used in the laboratory procedure.
2. Written laboratory reports which require the student to execute the experiments with proper technique and then apply the concepts to explain the results.
3. A midterm examination which requires the student to apply techniques and concepts learned in the laboratory procedures.
4. A comprehensive final examination.

Use of Results of Evaluation to Improve the Course

1. Evaluation and modification of laboratory techniques presentation during lab.
2. Prelab assignments will be graded and returned to the student prior to writing the laboratory report so that concept errors can be addressed before the student is required to use the material.
3. Laboratory reports will be corrected and used to pinpoint concept difficulties.
4. All evaluation methods will be used to determine the efficacy of the material presentation.

Detailed Topical Outline

1. Basic laboratory techniques
    a. Safety
    b. Common glassware
    c. Buret and graduated cylinder measurements
    d. Analytical and top loading balances
    e. Volumetric flasks and pipets
    f. Bunsen burners and heating

2. Basic laboratory procedure
   a. Volume measurement
   b. Balances and weight measurement
   c. Gas apparatus
   d. Calorimetry
   e. Molecular model kit
3. Chemical principles examined
   a. Density
   b. Formula and composition of a hydrate
   c. Physical changes and chemical reactions
   d. Types of chemical reactions
   e. Stoichiometry of chemical reactions
   f. Identification of common chemicals
   g. The gas laws
   h. Thermochemistry, heats of reactions
   i. Molecular models and covalent bonding